WASHINGTON STATE DEPARTMENT OF ECOLOGY

Mercury Awareness

Hazardous Waste and Toxics Reduction Program *Publication #01-04-022, Revised December 2003*

Do you use any of these items containing liquid mercury?

Laboratory Equipment
Fluorescent Lamps
Mercury Auto Switches
Mercury Flame Sensors
Mercury Float Switches
Mercury Flow Meters
Mercury Gas Flow Regulators
Mercury Manometers
Mercury Necklaces
Mercury Silent Wall Switches
Mercury Thermometers
Mercury Thermostats

Liquid Mercury…
Also known as quicksilver, metallic or elemental mercury, is an odorless, silvery colored liquid with a metallic luster.

Due to its unique physical properties, it is commonly used in thousands of household and commercial products and industrial processes.

If you do, be careful to keep them out of the trash or drain when they reach the end of their useful life or if spilled or broken. When mercury-containing debris is placed in the trash or poured down the drain, the mercury doesn't disappear. It finds its way into the environment from waste incinerators, landfills, or wastewater treatment facilities. **Minimizing mercury releases from all sources is important. It takes all of us to manage mercury.**

Why should I be concerned?

Mercury is one of a number of persistent bioaccumulative toxic chemicals (PBTs) that are being targeted by Washington State to reduce their presence in the environment. Mercury can cause serious ecological and health problems when released to the environment through human activities.

- **Children are most sensitive to mercury poisoning during early development to age six.** Mercury spilled from broken thermometers or toys collects in carpeting, furniture or other porous surfaces. Children can be exposed and seriously poisoned by breathing invisible vapors released to the air from these contaminated materials.
- **Mercury is toxic to the nervous system.** Short-term (high mercury concentration) exposure can result in nausea, shortness of breath, pneumonitis and bronchitis. Exposure to high levels of mercury over extended time can result in shakiness, tremors, numbness in the fingers and toes, loss of muscle control, memory loss and kidney disease in children and adults.

One of the primary environmental routes for human exposure to methylmercury (a more toxic form of mercury) is from eating contaminated fish. Unborn children are most at risk to methylmercury poisoning. In an aquatic environment, liquid mercury can be converted into methylmercury, a form of mercury that builds up in the tissue of certain species of wildlife, including game fish. Methylmercury in large fish can be hundreds of thousands of times greater than that in the surrounding water. Information about Fish Consumption Advisories is on page 5.

LOOK INSIDE TO LEARN ABOUT MERCURY-FREE ALTERNATIVES AND WHAT TO DO IF MERCURY IS SPILLED

How do I know if I use any of the mercury-containing devices listed on page 1? Are mercury-free alternatives available?

Mercury-containing devices are found in many households, as well as commercial and industrial settings, appliances, automobiles, laboratories, dental and medical facilities, etc. The following table shows the more common mercury-containing devices, where they may be found, and whether or not safer alternatives are available. For more information, check out the disposal guidance on page 5 and the references identified under Contacts and Resources on page 6.

Common Mercury-Containing Devices or Material		
Mercury-containing Device/Material	**Where They May Be Found**	**Alternatives**
Thermometers	Homes, hospitals, health care facilities, laboratories, industry	Digital, aneroid, and alcohol thermometers (red bulb)
Mercury switches (float, temperature-sensitive or mechanical tilt)	Automobiles, thermostats, silent light switches, chest freezers, sump and bilge pumps, light and traffic controls, lab equipment, high-voltage industrial equipment	Hard-contact, solid-state, or electro-optical switches, inductive, capacitive, photoelectric, or ultrasonic sensors
Necklaces with liquid mercury pendants	Shops that specialize in imported jewelry, flea markets, homes, schools	Recommend not purchasing jewelry with decorative pendants containing liquid mercury because the pendants are easily broken
Quicksilver maze toy or Chemistry kits	Toy distributors, retail locations, homes	Mercury-free toys and kits
Shoes that light up	Shoe distributors, retail locations, homes	Mercury-free shoes
Flame sensors	Gas-fired appliances with pilot lights, homes	Electric flame sensors, mercury-free products
Manometers/barometers	Devices that read air pressure in vacuum systems	Dial, digital, or glycerin-filled gauges
Waste dental amalgam	Dental clinics	Check with your dental supplier
Laboratory solutions	Clinical, research, academic, and environmental laboratories	Check with chemical reagent suppliers
Old latex paint	Everywhere	New latex paint (mercury was banned in latex paint in 1990)
Fluorescent/high density lamps and mercury vapor security lamps (mercury is released when lamps are broken or crushed)	Everywhere	Energy efficient lamps that contain reduced amounts of mercury
Alkaline batteries (prior to 1996) and button batteries	Everywhere	Rechargeable alkaline or mercury-free batteries such as zinc air types

How to handle a small mercury spill

Thermometers, manometers, blood pressure cuffs, and mercury-containing necklaces are the most common sources of small mercury spills because they are easily broken. Fortunately, small mercury spills can be simple to clean up and pose little risk to your health **unless** they occur on or within heated devices or if the mercury gets trapped in upholstery, carpeting, or other rough/cracked surfaces where there is an increased likelihood of human exposure and contact over time. Quick and proper cleanup of spilled mercury and adequate ventilation can greatly minimize the risks of exposure. The risks increase if an individual attempts to clean up a mercury spill with a vacuum cleaner, or if the mercury is heated. Mercury exposure is greatest in a small, poorly ventilated room. **Remember, even small mercury spills must be cleaned up.** Generally, small spills (less than two tablespoons) on smooth surfaces can be cleaned up by yourself using the proper precautions identified on page 4. For spills over two tablespoons or ANY spill on a cracked or porous surface, follow the guidelines for a large spill.

The easiest spill to clean up is the one that didn't.
Be careful – don't spill!

How to handle a large mercury spill

Steps for responding to liquid mercury spills exceeding one pound, (approximately 2 tablespoons): **IMMEDIATELY notify state and local authorities!** For a release to the environment of one pound or more, it is mandatory under federal regulations to call the numbers listed below:

- National Response Center at (800) 424-8802
- Washington Emergency Management Division at (800) 258-5990
- Regional Department of Ecology Spill Team for your county (see page 6)

In the meantime, ***quickly*** do the following:

Close off the area immediately to people and animals.

Call 911 or your local fire department, as human health may be adversely impacted.

If spill occurs inside a building, lower the thermostat to keep room temperatures below 65° F to keep evaporation at a minimum.

Open windows and ventilate to the outside.

Do not use heating, ventilating or air conditioning systems that circulate the air internally as a means of ventilation.

Surround and contain the spill if possible.

Prevent liquid mercury from running into nearby cracks, crevices, drains, and surface waters.

Did you know that….

- *One drop of mercury entering a 20-acre lake annually is enough to elevate the mercury level in fish?*
- *One teaspoon holds about 70 drops of mercury?*
- *The average thermometer holds 1-4 drops depending on size?*
- *Thermostats and switches hold 3-4 drops?*
- *A manometer holds about 4 tablespoons?*
- *Two tablespoons of liquid mercury weighs about one pound?*

For a small spill on a smooth surface:

- Remove all jewelry from hands or wrists so mercury does not adhere with precious metals. Put on **nitrile gloves or at least latex dishwashing gloves**.
- Push small mercury beads together with a **card, stiff paper, or squeegee** to form larger droplets and push them onto a **plastic dustpan** or use an eyedropper to pick up the balls of mercury. Work from the outside of the spill toward the center.
- Collect all mercury into a **leak-proof zip top plastic bag or wide-mouthed, sealable, plastic container**. When transferring the mercury to the plastic bag or container, work over a box lined with plastic wrap.
- Use a **flashlight** to look all around in the area of the spill. The light will reflect off the shiny mercury beads and make it easier to see them. Use **masking tape** to pick up stray beads.
- Sprinkle the spill area with **sulfur powder** (i.e., flowers of sulfur, available at some hardware or gardening supply stores) after cleaning up beads of mercury. If powder color changes from yellow to brown, mercury is still present and more clean up is needed.
- If needed, sprinkle **zinc flakes** (available at some hardware or gardening supply stores) over remaining mercury residue and mist with water. Using a **plastic or rubber scraper**, mix the materials into a paste.
- Scoop the paste up and wipe down the surfaces with a scraper and damp **cloth sponge**. Place the paste, sponge, scraper, all mercury-contaminated debris, and gloves into the zip top bag or sealable plastic container. Tape any sharp pieces of debris with tape before placing into bag or container. Place this bag or container into a second zip top bag and make sure it is tightly sealed. Securely wrap and tape the bag as a final precaution.
- Label the bag as Hazardous Waste – Mercury Spill Debris.
- Coordinate with the nearest small business/household hazardous waste collection center for disposal of the spill debris by contacting your county's Public Works or Health Department, see Contacts and Resources listed on page 6.

For ANY spill on porous/cracked surfaces such as carpet, upholstery, or concrete:

A porous surface is more difficult to clean, because the mercury can be easily trapped in porous surfaces, cracks and crevices. In these situations, trapped mercury can continue to emit harmful vapors if not fully removed. The safest and preferred clean up method for porous surfaces is the use of a specialized mercury HEPA-vacuum used by some university laboratories and/or spill clean up contractors. Spill contractors that will respond to mercury spills at homes and businesses in Washington State are listed on page 6. To reduce exposure during the interim, if an item is removable (carpeting, rug, furniture cover, etc.), it should be removed carefully, and sealed into a heavy-duty garbage bag. As an added precaution in situations where spilled mercury has been cleaned up from cracks or crevices (e.g., tiled floors), the surfaces can be sealed with epoxy paint or other sealing agent.

How do I dispose of the old mercury-containing items?

When in use, mercury-containing items are not an environmental threat; improper disposal is. **Please do not throw broken or discarded items into your regular trash container where they may end up in a landfill or burned in an incinerator**. If you are unsure if you have a mercury-containing device, check with the manufacturer, local service personnel, or product supplier to find out before disposal.

- **For households and small businesses:** contact your county's Public Works or Health Department for more information about household hazardous waste collection sites, recycling and disposal options for mercury-contaminated wastes or call 1-800-Recycle. A list of names and telephone numbers for Washington counties can be accessed at *http://www.ecy.wa.gov/programs/swfa/contact/recyclelinks.html*
- **For businesses that are considered medium or large generators of hazardous waste:** all mercury-contaminated waste is a regulated dangerous waste and, therefore, must be managed and disposed as a dangerous waste according to the Washington State *Dangerous Waste Regulations*, Chapter 173-303 of the Washington Administrative Code.

If a mercury spill occurs, NEVER do the following:

NEVER use an ordinary vacuum or shop vacuum to clean up mercury. The vacuum will put mercury vapor into the air and increase the likelihood of human exposure. The vacuum cleaner will be contaminated and have to be disposed as mercury-contaminated waste.

NEVER use household cleaning products to clean up mercury, particularly products that contain ammonia or chlorine. These chemicals will react violently with mercury, releasing a toxic gas.

NEVER use a broom or a paintbrush to clean up mercury. It will scatter the mercury droplets, making them harder to find and pick up.

NEVER pour or allow mercury to go down a drain where it has the potential of impacting the septic drain field. Also, since mercury is heavier than water, it often accumulates in the S-trap of a drain and continues to emit harmful vapors.

NEVER allow people whose shoes or clothing may be contaminated with mercury to move around, further contaminating the area.

NEVER wash fabrics heavily contaminated with mercury in a washing machine.

Documented mercury pollution in Washington State

As of this printing, there are four areas in Washington State that have **Fish Consumption Advisories** with mercury as a chemical of concern:

- ✗ Eagle Harbor (near Winslow)
- ✗ Lake Roosevelt (NE Washington)
- ✗ Sinclair Inlet (near Bremerton)
- ✗ Lake Whatcom (near Bellingham)

Fish advisories are updated often. We recommend that you check the State's Health Department (DOH) website at *http://www.doh.wa.gov/ehp/* or call your local health department for the most current information. DOH and local health jurisdictions share responsibility of using Fish and Shellfish Consumption Advisories to alert and inform citizens of possible health hazards associated with eating chemically contaminated fish and shellfish.

Contacts and Resources

Department of Ecology Spill Reporting Numbers

Northwest Regional Office	(425) 649-7000	Central Regional Office	(509) 575-2490
Southwest Regional Office	(360) 407-6300	Eastern Regional Office	(509) 329-3400

Mercury Spill Cleanup Contractors

Note: Some, but not all, use the mercury HEPA vacuums.

Cowlitz Clean Sweep	(888) 423-6316	http://web.mawebcenters.com/pnecorp2/services1_c.ivnu
First Strike Environmental	(800) 447-3558	http://www.firststrikeenvironmental.com
NRC Environmental Services	(800) 337-7455	http://www.nrces.com
Pacific Industrial Resources	(253) 437-0785	
PSC (small spills only)	(800) 228-7872	www.philipnow.com
RMCAT Environmental Services	(800) 930-0011	
Thermo Fluids	(800) 772-6733	http://www.thermofluids.com/main.htm

Mercury Spill Cleanup Kits and Supplies

Fisher Scientific	(800) 766-7000	Lab Safety Supply	(800) 356-0783
VWR Scientific	(800) 932-5000		

***DISCLAIMER**: The list of contractors and suppliers above was compiled to provide information about potential sources for mercury spill cleanup kits and services. It may not list all of the contractors or suppliers that service Washington State. The Department of Ecology does not recommend or endorse the products or services of any particular company listed above and does not imply that the companies are, or are not, in compliance with applicable federal and state environmental laws.*

Additional Resources

- Health and Environmental Effects of Mercury Thermometers and Mercury-Free Alternatives: http://www.epa.gov/glnpo/bnsdocs/hg/thermfaq.html
- Mercury-containing devices, how they are used and where they are located, including mercury-free alternatives if available: http://pasture.ecn.purdue.edu/~mercury/src/devicepage.htm
- "A Pollution Prevention Guide to Reducing Mercury Emissions from Health Care Facility Incinerators" (New York State Department of Environmental Conservation), mercury-containing devices and solutions in medical facilities: http://www.dec.state.ny.us/website/ppu/merchosp.pdf
- Mercury-containing devices and reagents and spill response procedures for an academic laboratory (University of Washington) http://www.ehs.washington.edu/services/spills_mercury.htm
- Pictures and information about necklaces with liquid mercury pendants: http://www.doh.wa.gov/ehp/ts/iaq/mercurynecklaces.html
- "Cleaning Up Small Mercury Spills" (Michigan Department of Environmental Quality) http://www.mi.gov/deq/0,1607,7-135-3585_4127_4175-11751--,00.html
- A list of companies that handle elemental mercury or mercury-containing devices (from King County's Local Hazardous Waste Management Program) *http://www.metrokc.gov/hazwaste/yb/mercury.html*